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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/971,973	10/05/2001	Tsutomu Ieki	P/1071-1433	5691

7590

05/23/2003

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EXAMINER

KINKEAD, ARNOLD M

ART UNIT

PAPER NUMBER

2817

DATE MAILED: 05/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/971,973

Applicant(s)

IEKI ET AL.

Examiner

Arnold M Kinkead

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on 05 October 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☐ Claim(s) 1-6, 11-14 and 16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1-6, 11-14 and 16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 24 January 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: 6/1/02

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DETAILED ACTION

*The preliminary amendment filed 10-05-01 has been entered.*

*Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

*Claim Rejections - 35 USC § 112*

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 3 – 6 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 3, last line, " the active device is mounted on the dielectric substrate" should this read instead package substrate which is consistent with the disclosure?

Claims 4-6, and 16 are indefinite by virtue of any dependence to claim 3.

*Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).
6. Claims 1,2,3,4, 5,6, and 11-14(as best understood) rejected under 35 U.S.C. 103(a) as being unpatentable over Nakamoto et al(US 5,187,451).

The reference by Nakamoto et al discloses an oscillator using a microstripline(see figure 1 and 2a) where a dielectric substrate with coupling line(inherent) for coupling to the other circuit elements. See col. 7, lines 52-68, which specifies that the dielectric substrate has a dielectric constant (20)which is higher than the glass epoxy substrate which the other elements are formed. These other elements include an active device connected to the coupling line(see figure 1, with stripline(1) connected to (Q1,active device) via coupling line. The microstripline resonator and active device forming the oscillator circuit(claim 1). Note a varactor(Cv) is shown as the frequency variable device to be mounted on the glass epoxy substrate(Claim 2,4). As noted in col. 7, lines 35-38, Thick Film processing for the microstripline resonator and inherent coupling lines allow for the formation of both elements at the same time(Claim 6). Note the biasing resistor and potential on the glass epoxy substrate(a dielectric) with the active device.(claim 5)

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The reference does not describe the glass epoxy substrate as the package substrate, a conventional dielectric substrate. Also, no disclosure for a low dielectric constant for this substrate is provided.(claim 1) Also, no disclosure for mounting the dielectric substrate on the package substrate by die bonding or flip-chip mounting and electrical connections via wire bonding.(claims 12-14).

With regards the last three mounting and bonding techniques, official notice is taken with these I.C. procedures, that is, electrically connecting elements

on the substrate via wire bonding is conventional. Die bonding , for example, by way of flow soldering, adhesives, pastes are also conventional. Finally,

flip chip mounting and wire bond mounting have been used in prior art oscillator circuits; these circuits have used wire bonds to connect active

devices to resonator and feedback circuits defined on substrates. A wire bond has relatively high parasitic inductance thus can introduce unacceptable

radiation loss. It is an advantage to eliminate leaded devices and wire bonds to reduce losses and parasitic inductance. Flip

chip or bump bonded chips have extremely low and uniform parasitic inductances.

Lastly, the glass epoxy substrate is a conventional, low dielectric constant(for example, 4)package substrate that is used as PCB material in the prior art(see citation) and serves as the base dielectric substrate, package substrate, for the entire oscillator circuit

In light of the above it would have been obvious for one of ordinary skill in the art at the time of the invention, to have recognized that oscillator circuit

with microstripline resonator of Nakamoto et al would have been designed with some of the various I.C. integration techniques including wire bonding,

flip chip and die bonding for mounting and making electrical contacts on a main substrate. The main substrate, glass epoxy as suggested is a low loss

dielectric with a constant(permittivity) of about 4 which is less than the permittivity(20) of the stripline resonator dielectric substrate. As noted in the

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reference; an inexpensive and simpler mounting process is achieved for the microstripline resonator oscillator circuit.

*Allowable Subject Matter*

7. Claim 16 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. The examiner could not find fair suggestion for the temperature characteristics as recited.

*Conclusion*

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Us 6,445,345 to Kamimoto et al discloses glass epoxy PCB for use as a dielectric substrate(see col. 3, lines 1-10) with constant( $\epsilon=4$ ).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arnold M Kinhead whose telephone number is 703-305-3486. The examiner can normally be reached on Mon-Fri, 8:30 am -5 pm.

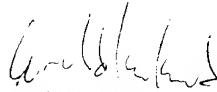
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on 703-308-4909. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7724 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

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A handwritten signature in black ink, appearing to read "Arnold M. Kinkead". The signature is stylized with a large, looped initial "A" and a long, sweeping underline.

Arnold M Kinkead

Primary Examiner

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Arnold Kinkead

May 18, 2003